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The EXTENSION ANIMAL HUSBANDMAN

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THE EXTENSION ANIMAL HUSBANDMAN

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ARIZONA'S CATTLE IMPROVEMENT PROGRAM

By E. L. Scott,* associate animal husbandman,
Arizona Agricultural Experiment Station.

Many livestock improvement programs of the past have never quite achieved their objective. Various reasons have been suggested f r their failure but always prominent among them is the fact that the producer of the quality product often feels that it does not command the premium to which it is entitled.

Despite this fundamental failure to receive returns in keeping with what the producer feels he deserves, the most progressive producers have continued to work toward the improvement of their product. Why? Three reasons may be cited and discussed briefly. First, a small premium is frequently paid. Despite the fact that it is often considered inadequate, the producer has taken pride in receiving it. This special premium many times is sufficient to give a fair return on the effort expended by the producer but often insufficient to remunerate him properly for the additional expense put into valuable breeding stock. Second, there is an economic advantage of being able to sell first on a declining or a glutted market. Examples of this advantage have been cited so frequently that further elaboration of the point is unnecessary. And third, an element of personal satisfaction comes to the producer from putting out a quality product.

The packer is not to be blamed for an alleged lack of appreciation of the quality product--at least not directly so. Ordinarily, the packer buys cattle on the basis of the value of the product purchased, the market level considered. Adequate competition insures that. His chief interest is not in what a lot of cattle have cost to produce but in how much their products will bring. One way to make the packer more responsive, financially, to a quality improvement program is to reach him via the housewife. A uniform system of grading beef accompanied by a thorough educational program should make the housewife more willing to pay a quality price for a quality product. Then the packer can give additional encouragement to livestock improvement programs and do so in its most constructive manner.

Recognizing the above considerations the animal husbandry department at the University of Arizona has put into effect a three phase beef cattle improvement program: (1) Improvement in seed stock, both registered and commercial; (2) determination of those factors that indicate the ability of cattle to make economical gains in pasture and feed lot; (3) and demonstration of the additional value in the quality product.

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* Since writing this article Dr. Scott has resigned to accept a commercial position with the Western Managed Farms Co. at Phoenix, Arizona.

Improved Seed Stock

Inasmuch as 99+ percent of the beef cattle in Arizona show a preponderance of Hereford breeding, the program to improve the seed stock is simplified. For example, the university maintains only the one breed of beef cattle on its farm. Through concentrated effort the university has developed one of the outstanding small breeding herds of beef cattle in the United States. The breeders of registered Herefords are proud of the university Herefords and through them are encouraged to improve their own herds.

The Arizona Hereford Association was organized for the purpose of getting concerted action among the breeders in the education of its members, the improvement of their breeding stock, and the dissemination of information pertaining to modern type in cattle. The progress made by the Arizona association in line with these objectives is remarkable. Certainly this progress alone is ample to justify the entire program.

The university has given still further encouragement to the breeders by assisting them in the selection of foundation herds and in the choice of herd bulls for breeding herds already established. More improved registered breeding stock has been brought into Arizona during the last five years than has been brought in during any previous quarter century. Many bulls of improved type and carrying the best blood obtainable have been added to our registered herds. These bulls are not fancy priced animals -- just good, practical improvement builders. It will be interesting to observe the effect of the dissemination of breeding stock from these establishments during the next ten years. The breeders of registered Herefords in Arizona are doing their part in building toward cattle improvement in the State.

The Tucson Livestock Show

In order to maintain the interest of the members of the Arizona Hereford Association, and to enlist the interest and support of the commercial producers, a livestock show was organized for the cattlemen of the State. This enterprise serves as the show window and clearing house of the improvement program. It is the vehicle that carries the interest stimulant and the potent drug of dependable information. Classes are provided for registered Herefords and for feeder steers. These classes, and the rules governing fitting for show, are unorthodox and adapted specifically to Arizona conditions.

The support that the show gets from the Arizona cattlemen , the degree to which it fulfills its purpose, and the practical standard which it maintains are unique. Numerous out-of-State visitors at the 1937 show maintain that there is no other show in the United States where the attendance is composed of such a high percentage of interested cattlemen.

Laying a Backlog for the Improvement of Commercial Cattle

Although much is known about what constitutes excellence in the feeder steer there is much yet to be learned on the subject, particularly under specific sets of conditions. The definition "a good feeder steer is one that will finish quickly and economically and that will yield a carcass of high market value" may be accepted as the only valid one in view of present knowledge. A rather carefully planned program is necessary in order to enable the commercial producer to make selections intelligently along these lines. A combined research and extension program intended to secure information on what constitutes excellence in Arizona feeder steers and to disseminate that information to Arizona producers has been set up in what is known as Arizona's Steer Feeding Test.

"Judges' Rating" Division

Arizona feeder steer entries, composed of 15 head conforming to either heavyweight or lightweight specifications, are delivered to the university farm on December 1. After a preliminary feeding period in a common lot these steers are sorted by brands and exhibited under the producer's name at the Tucson Livestock Show. Here the judge rates each entry and his five top selections in each division are accepted for the economy of gain and the killing-efficiency tests.

Economy of Gain Division

The second phase of the feeder steer contest, the economy of gain determination, is both interesting and valuable. Perhaps the greatest improvement in our common cattle over the next quarter of a century will be through lowering the amount of feed required to produce a unit of gain. Fundamentally that is a breeding problem. Its solution must be based upon information accumulated by different agencies, each contributing its findings to the general fund of knowledge on the subject. If the characteristics of an economical feeder and an efficient killer can be determined and this information passed to the feeder, he will begin to pay the producer accordingly.

Cattlemen's Program

In this feeding trial all entries are fed ad libitum, in separate lots, on a standard ration. At the close of the trial the cattlemen are invited to attend a cattlemen's program where they may study the cost records and see the finished cattle. Demonstrations of quality, grade, type, and finish are carried out in connection with the program.

Killing Efficiency

Having determined the cost of gains made by the different steer entries in the contest, the killing efficiency of the different lots are accurately determined at the packing plant. This type of information is for the purpose of getting the final word as to the value of the product to the packer. Entries that are acceptable in type and conformation, that make economical gains and that kill out with a high value to the packer are composed of valuable cattle. If the housewife rewards the packer, the packer will pass the advantage to the feeder, and if the feeder gives value received to the producer, quality cattle will bring quality prices and improvement will be accelerated.

Experimental Records

Feed records are kept by lots and individual records are made of weight, grade, condition, type, width, length of head, and other factors. These ratings are based upon the committee judgments rather than actual measurements. The controversy as to the need for accurate measurements as compared to practical judgments has not been settled--the latter method has been in use through necessity. In subsequent tests perhaps both methods will be used depending upon the results indicated when an analysis of the first three years' records has been made.

Sub-Contractors in the Improvement Program

In this improvement program the breeders of registered cattle are improving their seed stock and properly developing that stock for use on Arizona ranges. To this end the American Hereford Association is also giving support. The producers of feeder cattle are purchasing top breeding stock, culling, sorting, grading, and otherwise improving their cattle. They are cooperating in the work of determining those factors that indicate improved cattle. Both the registered breeders and the commercial producers are maintaining an active interest in Arizona's livestock show because of the good that institution is accomplishing in behalf of the cattle industry in Arizona. And finally, the animal husbandry department of the University of Arizona is planning, directing, and cementing various parts of the program into a unified whole. The subcontractors are each doing their part. Arizona's beef cattle improvement program is succeeding.

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THRIFT ON FARMS

An inquiry addressed to several hundred farmers reveals that 90.7 percent butcher their own hogs, the average number they killed for home use the past winter being 4.3 head. That thrift is not entirely absent from farm home economy is further attested by the fact that 68.3 percent reported home soap making. --The Corn Belt Farm Dailies.

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One thing, however, I must promise, that without the assistance of natural capacity, rules and precepts are of no efficacy. --Quintilian.

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1937 KANSAS LAMB PRODUCTION PROGRAM

By C. G. Elling, extension specialist in animal husbandry,
Kansas State College.

Our farm flock program started, in February with a series of 19 district schools widely distributed over the entire State. These district schools were attended by approximately five local leaders from each of the five to seven counties comprising the county groups into which the State is divided for the purpose of carrying on the extension programs. All the sheep producers in the county in which the district school was held were invited to attend the district school. The local leaders of the visiting county groups presented the district school program in their own county following the district school.

As a result of the 19 district schools, the same program was presented through the local leaders in 47 counties at county schools. In all, the program was presented in 66 counties of the State. At these programs, farm flock management and cooperative marketing of lambs on a graded basis, cooperative wool marketing, and the First Kansas Lamb and Wool School at Kansas City, Mo., were discussed.

The Producers Commission Association, The Midwest Wool Marketing Association, and The Kansas State Farm Bureau cooperated with the Extension Service in presenting these programs in all of the district and most of the county schools.

From about the first of March and continuing into June, many lamb-grading demonstrations have been conducted. Shipping of lambs cooperatively on a graded basis presented satisfactory conditions to conduct these demonstrations. Demonstrations and instructions in the production and preparation of fleeces were also included in these county programs.

The First Annual Kansas Lamb and Wool School was originated last November to be held at Kansas City as a State-wide school to demonstrate the results and necessity of a good practical production program in accordance with market requirements.

Beginning approximately May 15, county schools were held to select the personnel, lambs, and wool to be entered in the State school. The program which lasted two days was held in the American Royal building. Practically all the sheep-producing counties of the State were represented. On-foot and carcass-judging demonstrations

and practically all other types of educational activities in connection with sheep and wool were included in the program.

The following table demonstrates the high quality of the lamb carcasses at the school:

Comparative Table of Ten Best Lamb Flocks on Foot and in Carcass

County	Owner	On foot	In carcass	Avg. live weight	Dressing percentage
Harper	Henry Schmidt	1	1	73	57.3
Cowley	Martin Baird	2	5	80	57.7
Dickinson	M. E. Rohrer	3	2	82	57.4
Harvey	Oscar Berger	4	4	78	56.9
Chase	Curt Benninghoven	5	9	91	55.7
Coffey	Wayne Payer	6	10	83	54.9
Ottawa	Rodger Blanchard	7	7	92	53.6
McPherson	Paul Kaufman	8	6	76	57.0
Riley	Dan Casement	9	3	73	55.0
Washington	Ervin Duitsman	10	8	79	54.7

Many agencies cooperated whole-heartedly and substantially in making the program a success without which it would have been impossible to present such a large and varied program of demonstrations.

Among the cooperating agencies were the Safeway Stores and other stores handling Swift & Co. products which made it possible to return the ten top groups of five lambs each (or a total of 50 lamb carcasses) to stores located in the counties which produced them. In these local stores the prize-winning carcasses were put on display, and educational programs for both producers and consumers were conducted by extension workers. Such local demonstrations served a splendid purpose, in the localities where the lambs were produced, by increasing interest in both the production and consumption of a better product.

The State-wide school may be summarized as follows: (1) County schools to select entries for the State school; (2) the five leaders from each county who attended the State school will present, so far as possible, the information obtained at the State school on their respective county programs; (3) the ten top groups of lamb carcasses were returned to their respective counties to be used in county educational programs.

Dr. O. O. Wolf, President, Kansas State Farm Bureau, and Mr. C. B. Denman of the National Association of Food Chains cooperated very effectively in making the arrangements to have the carcasses returned to the counties from which the lambs came, for the purpose of conducting the county schools.

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THE PENNSYLVANIA STATE SWINE SHOW AND SALE

By L. C. Madison, extension swine specialist,
Pennsylvania State College.

The show and sale of swine at the Pennsylvania Farm Show in Harrisburg during the month of January each year is unique among the shows and sales of purebred livestock, as no similar event is held in any other State.

When the new Farm Show building was erected in 1931 and premium money was appropriated, the extension livestock specialists recommended that as space and premium money was limited, instead of spreading out the money that was available for prizes in the swine division over a standard classification, it should be divided into substantial prizes in three classes of bred sows for each breed, and the entries limited to 30 animals per breed and all animals sold at auction. This recommendation was voted on favorably by the several State swine breed associations and accepted by the State show commission. The classification at present is as follows:

	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th
Junior yearling sows	$30	$25	$20	$15	$10										
Senior sow pigs	$30	$25	$20	$15	$10	$5	$5	$5	$5	$5					
Junior sow pigs	$30	$25	$20	$15	$10	$5	$5	$5	$5	$5	$5	$5	$5	$5	$5

The above classes are for bred sows which must be sold at public auction during the week of the show after the animals have been placed in the show ring. Both the exhibitor and purchaser receive ribbons, the money award going to the exhibitor.

There were a number of reasons against a standard classification and in favor of the system used. Among the most important objections are: (1) The show comes at the wrong time in the year to show hogs, as few are in show shape at that season and it is dangerous to ship a show herd so close to farrowing time; (2) only a few breeders in Pennsylvania have herds large enough to fit a complete herd at any time and a standard classification for a winter show would simply subsidize four or five herds owned by wealthy people; (3) the cost of exhibiting one or two head would be prohibitive and would exclude the small breeder who would like to be represented.

The classification as developed with the restrictions in force has the following advantages: (1) The premium money even for last place pays most of the expense of exhibiting; (2) only animals of an attractive age and condition are exhibited; (3) arrangements are made to care for all animals as a group and the owner is not required to be present for the week; (4) the attractive premium money brings out really worth while individuals; and (5) only young animals are shown.

Combining the show with the sale adds the following features: (1) A worthwhile project is provided for the several State swine breed associations which helps to keep them active; (2) a standard of values for Pennsylvania is set for purebred hogs of good quality; (3) a market place is provided for the small breeder with a few outstanding animals; (4) a source of supply is made available where those in search of outstanding individuals can secure animals that have been passed on by competent judges; (5) the buyer has confidence in his purchase as it has the backing and guaranty of the State swine breed association; (6) breeders from outside the State are attracted to Pennsylvania as a source of purebred swine; (7) the large number of animals sold make it possible to advertise extensively and sell effectively at a low average cost per animal.

From an extension standpoint the event has the following additional advantages: (1) Encourages a large number of farmers to take an active interest in the show and the incidental breed activities; (2) makes it possible for the small breeder to participate; (3) the publicity and exhibition brings to the attention of the farmers the value of well-bred stock; (4) the sale distributes good foundation animals to all parts of the State and these serve as seed stock for their communities; (5) the sale furnishes an outlet for "top" breeding animals and stimulates further breeding efforts on the part of breeders to maintain their herds at a high standard.

The results of the use of this classification in our show and sale have been very gratifying. Naturally the premium list attracted a few undesirable animals to the first few shows, but they were placed at the bottom of the class and in most cases did not receive any prize money. Placing at the bottom of the class they sold at a low price and when the expense of getting these animals to the show and exhibiting was deducted from the sale price, the owners lost money and as a result this type of animal and their exhibitors have disappeared from the show. The standard gradually has improved until at the present time many outstanding individuals of the several breeds are shown and the average quality is very high, with no really poor animals present.

About 130 animals are exhibited each year and an idea of the interest in the show and sale and the distribution as a result of the sale is indicated by the fact that at the last sale in January 1937 the average price of the Berkshires was $92 with a top price of $200 while the Chester Whites averaged $60 with a top price of $100, the Duroc Jerseys $71 with a top price of $135, the Hampshires $59 with a top price of $105, and the Poland Chinas $63 with a top price of $100.

Twenty-five exhibitors from 12 counties in Pennsylvania consigned these animals, and they were purchased by 66 farmers in 26 counties in Pennsylvania. In addition 25 head went to 14 breeders in the eight following States: Indiana, New Jersey, Delaware, Maryland, Ohio, Florida, Wisconsin, and Minnesota.

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4-H PIG CLUB BOYS STUDY CARCASSES

Boys in the 4-H pig club work learned something about the kind of carcasses which were produced from their market barrows in the second annual pork carcass judging contest held at the 1936 Iowa State Fair. The 22 market barrows were judged on foot by Don Britton, head hog buyer for the Iowa Packing Co., and A. L. Anderson of the animal husbandry department, Iowa State College. The ribbons were tied on the basis of three groupings. The blue ribbon group consisted of 5 pigs; the red ribbon group of 12 pigs, and the remaining 5 pigs were placed in the white ribbon group. Ten county carcass-judging teams composed of three boys each competed in a judging contest. Each contestant was required to place four classes of fat barrows on foot according to his estimate of the dressing qualities of the pigs. The classes were selected from the same pigs which were later judged by Messrs. Britton and Anderson. The pigs were then slaughtered by the Iowa Packing Co., and the carcasses placed by C. W. McDonald of the Iowa Extension Service and B. R. Chapman of the Iowa Packing Co. The carcasses were then arranged on the rail as they were numbered in the 4-H judging and the teams given the opportunity to compare the placings of the judges with their estimates made on foot.

It was interesting to observe that one of the pigs placed on foot in the blue ribbon group by the official judges yielded the carcass which was ranked first. However, two other members of the blue ribbon group produced carcasses ranking fourth and fifth, while the remaining two pigs which gained the blue ribbon award on foot, placed eighth and eleventh in the carcass. The second and third ranking carcasses came from pigs in the red ribbon group, as did the carcasses placing sixth, seventh and ninth. The highest placing given a carcass from the white ribbon group was tenth, while the lowest ranking given the carcass of a red ribbon pig was twentieth. ---From Iowa Annual Report, 1936.

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STUDENT SCORE CARDS AVAILABLE

Score cards for breeding beef cattle and for fat and feeder cattle are available to extension workers or animal husbandry instructors for use in teaching beef cattle judging, upon request to the undersigned. Please order by form number. A. H. Form 255 is for fat and feeder cattle and A. H. Form 256 is for breeding cattle. ---C. D. Lowe

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REDUCE TRICHINOSIS

It is highly important at this time to bring home to swine producers the necessity of trichina control as a measure of protection to the swine industry and as a safeguard of human health. From time to time the Bureau has issued leaflets, posters and press releases as a means of informing the public regarding the danger of trichinosis which sometimes follows the consumption of raw and imperfectly cooked pork. However, if the persistence of trichinosis in man continues it is likely to react unfavorably on the consumption of pork in this country and thus injure hog producers financially.

Inasmuch as investigations conducted in the Bureau have shown that the incidence of trichinae in garbage-fed hogs is much higher than that in hogs not fed garbage, it is essential to stress that the feeding of raw garbage to swine tends to spread trichinosis. Other sources of trichinosis in swine are: (1) The feeding of offal from slaughter houses; (2) the feeding of the contents of scrap barrels; (3) the failure to bury, burn or otherwise dispose of the carcasses of hogs, dogs, cats, rats, and other animals which die on lots and pastures and which may be eaten by hogs.

A strict adherence to the swine sanitation program, as developed by the Bureau, will aid in preventing the spread of trichinae among hogs and will materially reduce the incidence and intensity of infestation with these parasites. The sanitation system precludes the feeding of garbage, offal, kitchen scraps, and other feed containing scraps of raw pork, and involves the use of clean pastures and sanitary housing. This system has been shown to decrease the cost of swine production, to favor the growth and development of pigs, and to result in the finishing of pigs for market when from 6 to 7 months of age. These factors alone justify the wide adoption of the system by hog growers. But in addition, the program, if carried out as recommended, will greatly reduce if not eliminate altogether trichinosis in swine.

The following publications pertaining to the subject are available from the Bureau of Animal Industry:

Leaflet No. 34 --Trichinosis, a Disease Caused by Eating Raw Pork.
Series A.I.39 --Cook Pork and Its Products Thoroughly.
Leaflet No. 5 --The Prevention of Roundworms in Pigs.
Leaflet No. 108 --Controlling Kidney Worms in Swine in the Southern States.
Poster--Cook Pork and Its Products Thoroughly.

--Excerpts from statements of Dr. J. R. Mohler,
Chief, Bureau of Animal Industry.

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BEEF CATTLE FOR THE COTTON FARMER

By J. R. Hawkins, extension animal husbandman,
South Carolina Extension Service.

A certain county agent in South Carolina called his committee on program planning together and successfully worked out a plan of agricultural adjustment for the improvement of conditions in his county. This plan involved an increase of the acreage planted to legumes, pasture and feed crops, and a reduction in the acreage planted to cash crops. The county agent was struck by the great similarity of this program to one which had been worked out ten years earlier, by a committee of farmers in his county. Again looking over the recommendations made 40 years earlier by the agricultural society of his county he found that an increase in the legumes and feed crops, the planting of pastures, a reduction in the acreage devoted to cash crops, and a better balance between livestock production and crop production were advocated by the members of this society at that time.

Evidently then, the problems which face us now are not new but recur with emphasis and with striking regularity. When we seek for facts which would argue for an increase in beef cattle on farms, and particularly the feeding of cattle where crop production comprises the major enterprise, we find experimental work bearing on this subject was done early in the last decade. A comparison was made of several fertilizer combinations used alone and used in connection with manure for the production of cotton. The most economical production of cotton occurred where the less expensive fertilizer elements such as phosphorus and potash were combined with fairly liberal quantities of manure. Again during the present decade manure has been compared with winter cover crops where cotton has followed cotton, and it has been found that over a period of years the manure has shown an increase in the net income of approximately $10 per acre per year. These tests were made on Piedmont soils which are notably low in organic matter, but on which satisfactory yields of cotton have been produced by means of application of a balanced commercial fertilizer.

Numerous instances are found in which farmers are willing to feed cattle without making a profit on the operation if they can pay the feed bill and clear the manure. Their observations have been that where cattle are fed heavy rations of cottonseed meal and other feeds which have a high fertilizing value, that an increase in the yield of cotton of 1/4 to 1/2 bale per acre follows the application of the manure, other crops responding in about the same proportion. In an effort to get more definite figures as to just how much increase in the yield of cotton follows the application of manure, checks have been made on farms where cattle feeding has

been practiced and the yield on land which has received no manure but had been treated with a liberal application of a balanced commercial fertilizer. Over a period of two years the lowest of these checks has shown an increase of 300 pounds of seed cotton per acre and the highest 525 pounds. On a basis of the return per steer fed the increase in the value of the crop has ranged from $13 to $44 per head with an average of something over $20. Inasmuch as the benefit to be derived from the use of manure may be expected to continue for three or more years with a decreasing result, it becomes apparent that the advantage of feeding cattle on a farm devoted chiefly to the production of cash crops far outweighs the direct profit to be made on the cattle during the feeding period.

Truck farmers producing green leafy vegetables for market have found manure to be a great stimulant in pushing these crops forward, and that they can frequently get them to market two weeks earlier which in times of scarcity may mean large profits. One farmer has found that manure applied to the land to be planted in such crops has yielded returns of $50 per load under conditions where the time element was of extreme importance in determining the price of the crop.

The recent report of the cotton-growing contest in this State emphasizes the fact that good staple length in cotton is to a large extent determined by the humus content in the soil. Inasmuch as considerable emphasis is now being put on the production of a better cotton staple, this fact would seem to be of great importance. It is significant to note that a considerable number of the prize winners in the cotton contest have used stable manure liberally on their contest plots. Serious consideration of these facts leads to the conclusion that the production and feeding of cattle on farms has an important bearing on the crop yields and the profits to be made on cash crops.

We are impressed anew by the rotation of the wheel of agricultural progress which follows the broad road of fundamental improvement traversed by our grandfathers--a road which leads us to the point where we may expect to see more cattle produced and fed on farms where crop production constitutes the major enterprise.

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HOW TO WRITE FOR THE FARM PRESS

1. Limit yourself to a given number of words.
2. Outline the salient points of the subject.
3. Hook them together with short terse sentences. Be epigrammatic. When in doubt use a period.
4. Write it in the first person. I came, I saw, I conquered.
5. Go over the manuscript and strike out half of your adjectives. More as you grow stronger.
6. If there are any sentences or phrases that especially appeal to you, strike them out. They mean more to you, than to your reader.
7. Where possible, use illustrative material. Your story in pictures leaves nothing untold.
8. And, finally, whatever you do, use simple language. Call a spade a "spade," and not an instrument of manual husbandry.

--Paul D. Sanders, Editor, Southern Planter

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BEEF CATTLE EXTENSION NOTES

California

In Lassen County a 4-H bull club was organized during the year, wherein the club members purchased in the fall of 1935, 14 purebred Hereford bull calves with the assistance of the county agricultural agent and the livestock specialist. The club members fed these young bulls for development and sold them as range bulls to local stockmen in the fall of 1936. The project was successful and in the early fall of 1936 the club purchased 18 more purebred bull calves to be used in their 1937 project. A similar program was started the same fall with the vocational agriculture class of the McArthur High School in Shasta County. The instructor, a practical stockman, was delegated to purchase from Montana a carload of purebred Hereford bulls. Part of these bulls are to be retained as a Future Farmers' project and are to be sold as range bulls to stockmen next fall. The remainder of the carload went directly to stockmen. The livestock specialist is also cooperating with this project. It is expected that these developments will do much to aid the breeding herd management program in the northeastern counties of the State. --L. H. Rochford in 1936 Annual Report.

Colorado

Controlled breeding demonstrations with cattle are making progress in this State. In the summer of 1934, M. T. Everhart of the Hatchett Cattle Company took 200 cows out of his herd and hand-bred them. Mr. Everhart utilizes a series of small pastures, each with running water, in applying the plan. The cows are placed in these small pastures and the bulls held in another adjoining pasture. Single services of the bull are employed and the identity of the cow and the breeding date are recorded. After breeding the cows are put in a larger pasture where another bull is available to catch any which did not conceive at the first breeding.

The cows in the controlled breeding group are saving from 95 to 98 percent calf crop and the calves are being dropped within a relatively short period, whereas the cows in the remainder of the herd are saving only about a 70 percent calf crop.

Myers Bros. of Hoehne, who have practiced a similar system raised 215 calves from 230 cows in 1935. In 1933 their calf crop was 78 percent, and in 1934 it reached 88 percent. If they continue to progress they are likely to make it 100 percent.

Other applications of the plan have brought similar results. --A. C. Allen in 1936 Annual Report.

Illinois

A "Big Brother" plan of initiating newly purchased calves into proper feed-lot behavior was demonstrated by William Coney of Iroquois County. For several years he has followed the plan of buying his steer calves each fall about a month before he sells the fat yearlings. The calves are turned right in with the fat cattle. Many a calf selects some steer with which to associate. All the calves follow the example of the older steers and learn to eat grain right away. At the time of a meeting held on his farm this year Mr. Coney's calves had been in the feed-lot about a month and were doing exceedingly well. Cattle feeders were greatly impressed with his plan of getting calves started on feed. --E. T. Robbins in 1936 Annual Report.

Indiana

An unusual amount of interest was shown in the Hoosier Thousand Pound Calf Club during the past year. Seventeen cooperators located in 13 different counties and owning 45 calves were enrolled. The object of this project is to demonstrate the practicability of full feeding beef calves from birth until finished at around the 1,000-pound weight when one year old. Cattlemen are always interested in the weigh-up meetings held on the farms of successful cooperators. Typical of such meetings was one held on the farm of Harry V. Elrod in Lawrence County. Mr. Elrod had made an unusually good record by producing three Aberdeen-Angus calves each of which weighed more than 1,000 pounds, their average weight being 1,072.6 pounds. Mr. Elrod explained how he had fed the calves and how he had managed and fed his cow herd. The sire of the calves was also offered for inspection and the meeting ended with a general discussion of the various problems of the Indiana beef herd owner. --P. T. Brown in 1936 Annual Report.

Iowa

The oldest cattle feeders' association in the State is in Buena Vista County where the organization has been carrying on a continuous year to year program for 19 years. Since the membership of this group is made up almost exclusively of feeders, one of their chief interests is the study of the beef cattle outlook and the business side of the enterprise. A meeting is held each October and again six months later. The week for the next meeting is always announced at the current one. Some 30 other counties have similar organizations, which as a rule hold semi-annual meetings for the discussion of matters of especial interest to steer feeders.

These meetings afford excellent opportunity for the college

animal husbandmen to contact these groups. As a rule no membership fee is charged and the only requirement for membership is interest in steer feeding. In addition to the semi-annual meetings the associations conduct annual tours and are greatly interested in feeding records and cost accounting. --Rex Beresford in 1936 Annual Report.

Michigan

The Michigan beef calf feeding project is open to any farmer using a purebred beef or dual-purpose bull. Calves are rated on the average daily gain made over a 210-day feeding period and those gaining an average of 2 pounds or more per day are eligible to show at the State Farmers' Week in February. Initial weights are taken in the month of June and the calves divided into senior and junior groups with January 1 being the dividing line as to age. Feed and cost records and management practices followed are required. Awards are based 60 percent on rates of gain and 40 percent on show ring placing. After the show the calves are sold at auction.

Ninety calves were enrolled in the 1936 project, which was the largest number for one year in the six years' history of the contest. Fifty seven head made the required rate of gain and 55 were exhibited. The average daily rate of gain was 2.4 pounds. The winning calf, a Shorthorn, made an average daily gain of 2.968 pounds. Two other calves gained more than 2.9 pounds. The calves sold for an average of $13.69 per hundredweight.

One of the pleasing results of the project was the fact that many of the exhibitors were young men who had just completed their 4-H club work. --D. H. LaVoi in 1936 Annual Report.

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OFFICIAL PERSONNEL NOTES

Arizona

Chas. U. Pickrell, who, since 1923, has held the post of livestock specialist in the Arizona Extension Service, was made director of that service on April 28, 1937.

Tennessee

J. S. Robinson has been made assistant to L. A. Richardson in livestock extension work in the Volunteer State.

Utah

W. E. Carroll of the University of Illinois has been appointed dean of agriculture and animal husbandman in the college of agriculture succeeding E. J. Maynard, resigned.

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SOME STATISTICAL RESULTS, 1936

Alabama

537 club members completed beef cattle projects; 4, sheep projects; 4,454, swine projects; and 11, work stock projects during the year, with 511, 49, 5,791 and 14 animals, respectively, involved. 461 farmers were aided in procuring purebred beef sires; 15, with purebred rams; 440, with purebred boars; and 41, with jacks. 3,630 families were aided in various kinds of meat work. Two million pounds of pork were cured in 22 ice plants and 968,945 quarts of beef were canned. 700 brood mares were placed in 18 counties in cooperation with Resettlement Administration.

Florida

Sixty-four 4-H club members completed beef cattle projects. 700 purebred beef bulls and 421 purebred boars were placed, also 11 jacks, 13 stallions, and 400 brood mares. 50 trench and 3 upright silos were constructed. The State now has 47 cold storage plants located in 21 counties, curing meat for farmers. In the 1935-36 season 5,763,813 pounds of meat were cured in such plants and 107,000 pounds in ice boxes. 328 families were assisted in the home curing of meats.

Georgia

690 purebred beef-type bulls and 544 purebred or high-grade females were placed on farms in Georgia during 1936, and 20 purebred rams and 16 purebred ewes during the same period. 339 purebred bulls and 245 purebred or high-grade females were placed in 1935 and 42 purebred rams and 19 ewes during 1935, an increase in 1936 of 351 purebred bulls and 299 female beef cattle.

Eight herds of purebred beef cattle were established in as many counties of the State during 1936. There were three district shows and sales held, and eight additional cooperative sales in which 2,830 head of cattle, weighing 2,049,049 pounds, sold for a total of $146,743.68, or an average price of $.071 per pound.

1,169 calves are being fed out by 4-H Club boys and girls from 60 counties for the 1937 spring shows and sales, which is the largest number of 4-H Club members in this department in the history of club work in Georgia.

Missouri

25 counties reported 35 4-H pig clubs with 318 individual members. Ten counties had 15 colt clubs with 83 members owning 119 colts. 43 counties had 73 baby beef clubs with an enrollment of 675 members.

Montana

104 purebred boars were placed in 22 counties. 176 club members in 18 counties completed pig-feeding projects involving 314 hogs. 13 farmers in 10 counties obtained purebred stallions. 229 club members in 21 counties finished 268 beef calves. 454 purebred beef bulls were placed. 114 club members with 409 animals finished sheep projects in 15 counties. 529 growers pooled 1,291,520 pounds of wool.

North Carolina

160 purebred beef bulls were placed. 275 silos were built in 59 counties. 102 4-H club members completed beef-calf projects in 21 counties. 71 purebred rams were placed. 38 hog slaughtering, cutting, and curing demonstrations were held in 14 counties with a total attendance of 968. 67 swine feeding demonstrations, involving 1,667 hogs, were conducted in 24 counties.

Tennessee

927 head of brood mares were placed in 27 counties, also 21 jacks in 18 counties. 430,910 pounds of wool were sold cooperatively in 42 county pools. 10 beef and 17 pork demonstrations were held in 22 counties with a total attendance of 765.

Utah

107 4-H club members completed sheep projects involving 593 purebred and 87 grade sheep.

Virginia

5 draft stallions, 166 beef bulls, 450 rams, and 110 boars were placed in the Better-Sires project this year. 853,362 pounds of wool were marketed cooperatively from 29 counties. 36,274 lambs were marketed on a graded basis from 25 counties. 143 baby beeves were fed out by 4-H club members in 18 counties. 536 lambs were fed out by 149 4-H club members in 28 counties. 1,604 market pigs, 506 breeding pigs, and 880 sow and litter animals were handled by 1551 4-H club members.

Wyoming

168 beef calf club members enrolled and 130 completed projects in 11 counties. 57 trench silos were constructed.

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HORSE EXTENSION NOTES

Indiana

Eighty-six Belgian and 70 Percheron stallions were exhibited at the three district stallion shows held in March, 1937. These shows were located at Indianapolis, Muncie, and Connersville. Prof. E. A. Trowbridge of Missouri did the judging.

This was the fourth year for spring stallion shows in Indiana and entries and public interest demonstrated that they are still growing in popularity. The shows are organized on a district basis and entries limited to horses owned or leased in their respective districts. The object of the shows is to encourage mare owners to breed to the best stallions available to them.

These shows are definitely tied up with the Hoosier Gold Medal Colt Club and many of the stallions exhibited this year were either former Gold Medal colts or sires of Gold Medal colts. In this manner sires are thrown into very definite competition with one another both as to their ability as sires and as individuals. Breeders are therefore better able to evaluate the true value of stallions in their communities. A sire whose foals win year after year in the Gold Medal Colt Club, and which individually is good enough to rank high in the stallion shows, eventually reaches the place where he is regarded as a proved sire. This is a constructive contribution to horse improvement in the State and its influence is readily discernable. --P. T. Brown in "The Draft Horse."

Iowa

Some phase of horse work other than colt clubs was included in the extension program of 52 counties. Demonstrations in the use of multiple hitches or in colt breaking were conducted in 22 counties. In all, 79 other than club meetings for the discussion of horse breeding, feeding, and management problems were held in 30 counties. Colt clubs were organized and conducted in 95 counties with a membership of 1,262 enrolled in first-year work, and 391 in second-year work. A total of 1,653 boys and girls were engaged in colt-club work. Colt shows either as a feature of fairs or as special events were held in 127 communities. --From Iowa Annual Report, 1936.

North Dakota

Six county colt shows at which about 200 good colts were exhibited by adult and junior owners were held in 1936 in cooperation with the North Dakota Stallion Registration Board. To be eligible to show, colts had to be sired by licensed stallions. The board offered premium money to the shows on the following basis:

$60	providing	50	or more	colts	were	shown
50	"	40	to 49	"	"	"
40	"	30	to 39	"	"	"
30	"	20	to 29	"	"	"
20	"	15	to 19	"	"	"
15	"	10	to 14	"	"	"

This money was supplemented by premiums from other sources. Judging demonstrations were held in connection with these events and reasons for the placings made were given by the judge for each class. Fully 2,000 people attended these shows and it is planned to continue and if possible expand the project next year. --Geo. J. Baker in North Dakota Annual Report, 1936.

Ohio

Fifty-six counties had an enrollment of 474 members in 4-H colt-club projects in 1936. Many of the colt shows are sponsored by the county horse breeders' associations in which 4-H colt club classes receive special recognition. Such encouragement has helped materially in promoting interest in the project.

Williams County had the largest 4-H colt-club enrollment in 1936 with a total of 34 members of which 31 completed their assignments. At the county show club members were important contenders in the open classes and won most of the gelding classes.

An interesting observation in connection with the 4-H colt-club work is that the greatest interest has not always been shown in the leading horse breeding counties but rather in those counties where the county agent is keenly interested and working closely with an active county horse breeders' association. County 4-H colt-club tours in which local horsemen have cooperated proved very helpful during the past year. The interest of 4-H club members in the colt project has been rather surprising for it has been stated that the tractor had already captured the interest and imagination of most of our rural youth. --L.P. McCann in Ohio Annual Report, 1936.

Pennsylvania

Interest in the draft horse is being aroused and the necessity for more colts to replace old horses is being realized. The Gold Medal Colt Club has made definite contributions in this field. The object of this club is to show the value of proper care, good breeding, and liberal feeding in the development of draft horses. Seventeen counties had 24 Gold Medal Colt Clubs in 1936 with a total

enrollment of 318 colts. These clubs provided the basis for very pointed demonstrations in good draft-horse management.

In these clubs the colts are weighed as weanlings, about county-fair time, and carried through the ensuing year. At the end of this period the colts again are weighed and judged individually. Awards are made on the basis of gains and individuality. --C. J. Burge in Pennsylvania Annual Report, 1936.

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DIRECTING GRAZING HABITS AS A MEANS OF BALANCING FERTILITY ON UNEVEN GROUND

By J. E. Nordby, associate professor of animal husbandry,
University of Idaho.

The problem of getting livestock to graze evenly on hilly ground is often a difficult one. For the most part they will overgraze the higher ground and undergraze the lower areas. This is particularly true on sweet clover forage which often grows very profusely on the lower ground where it is coarser and probably less palatable than it is on the hilltops. Sheep have the habit of grazing the preferred spots so closely that the growth of the forage is greatly impaired.

It is well understood that plants which are grazed closely cannot grow so rapidly as plants that are left more undisturbed. This lack of balance in the crop growth on the low and high areas in the field contributes further to the already unbalanced state of fertility in such areas. A large growth of sweet clover builds up the soil faster than a small crop.

The author has observed for a number of years a practice that has been successfully used in balancing the grazing habits and consequently the fertility of uneven ground. As soon as the cattle or sheep begin to graze too heavily on selected spots, fresh barnyard manure is distributed thinly with a spreader over them. This will discourage cattle and particularly sheep from further grazing until the sweet clover has grown well above the manurial residue. It is to be observed at this point that the light application of manure will tend materially to build up the organic matter and fertility on the higher ground so a better balance will prevail in the productivity of the uneven ground.

This practice is of especial value at this time when so many hilltops are being seeded down to legumes or perennial grasses under the soil conservation program. The farmer may wish to pasture off the aftermath in the fields in which these small grass-planted areas are located. However, inasmuch as the growth on these plots is more palatable than the browse in the field, the livestock often graze it "into the ground" before they do the right sort of a job on the aftermath. The planted areas are often small, irregular in shape, and too expensive to fence. To preserve them from overgrazing without the expense of fence, the manure application is practical. Almost any kind of fresh manure will discourage sheep. For cattle it is preferable to use well-rotted mixed manure or fresh cow manure, although fresh horse manure will be very helpful.

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IDAHO RESULTS FOR 1936 SUMMARIZED

Marketing data were compiled on 39,015 head of cattle from Idaho ranges and feed lots. Production records were obtained on 999 steer calves, 355 yearlings, 4,681 two-year-old and 447 three-year-old steers. The calves and yearlings sold as stockers and feeders, 40 percent of the calves and 31 percent of the yearlings going as stockers. The two- and three-year-old steers went either to the feed lot or direct to market, 41 percent of the former and 68 percent of the latter going direct to market as grass fat cattle. Comparative figures on 16,466 range steers, consisting of yearlings, twos and threes, showed an average value of $42.24 per head for the top yearlings selling as choice feeders, $65.60 for the two-year-olds, and $90.21 for the three-year-olds selling as grass fat cattle. From the feed lot the yearlings brought $55.54 per head, the two-year-olds $71.71 and the three-year-olds $93.02 on the average.

Work with beef cattle required 110 days in the field, with 338 visits to ranches and ranges. In addition there were 836 office calls and individual conferences at roundups and stockyards. Thirty-seven general cattle meetings attended by 1503 persons were held and 18 demonstration meetings with 292 in attendance. The total number of cattle involved was 69,608 head consisting of 45,368 range cattle, 2,492 purebreds, and 21,748 feed lot cattle.

Sheep work was conducted with range, farm, and purebred outfits. With improved prices of lambs and wool the range sheep industry again showed a profit, which enabled sheepmen to reduce their indebtedness. The profit per ewe varied, ranging from 11 cents to $1.16 for the different holdings. Market data on 872,557 range lambs revealed that 73.3 percent classified as fat, 20.8 percent as feeders, and 5.8 percent as culls. The average market weight of the lambs was 79.5 pounds and the selling price $8.95 per hundredweight on the market, which was $6.59 per head.

The main work with the purebred industry had to do with the selection and preparation of rams for the two State sales, at which 1,440 rams sold for an average price of $29.80 per head.

Work with the farm sheep industry consisted mostly of meetings with the county lamb and wool pool associations and in grading and sorting demonstrations. One pool was discontinued but three new ones were organized. Reports from the marketing of 78,174 farm lambs showed 84 percent selling as fat slaughter lambs, 9 percent as feeders, and 7 percent as seconds and culls. The average market weight was 78.9 pounds and the average return per head to the grower was $6.50.

Sheep work required 82 days in the field, during which 279 farm and ranch visits were made. There were 924 office calls and individual conferences. Twenty-six sheep meetings were held, of which 5 were demonstration meetings with a total attendance of 811.

Swine work consisting of the ton-litter contest, 4-H pig club work and assistance to cooperative hog shipping associations required a total of 17 days in the field, during which 54 farm visits were made. Office calls and individual conferences on swine problems totaled 219. Nine meetings including one demonstration meeting had a total attendance of 332.

From Annual Report of E. F. Rinehart.

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THE GRAZIER'S ALPHABET

By Thos. D. Hall, Agronomist, South Africa.

A stands for our AIM, which is pastures to boost.
If you don't like our theme just hop off to roost.
B stands for the BEEF we're all hoping to sell,
when good pastures we've got and prime oxen as well.
C stands for the CATTLE well spread o'er the land.
We want better stuff and less of scrub brand.
D stands for the DROUGHT grim spectre we dread,
when silage and hay are not there to be fed.
E stands for the EVENING--the end of our day--
when beasts are all full and we hit our own hay.
F stands for the FENCES and FERTILITY right;
you'll be proud of your pastures and they'll be a sight.
G stands for our GRASSES--we've five hundred or so,
which makes us quite sure we'll give pastures a go.
H stands for the HEIGHT it is best to graze grass--
if you miss the right stage the minerals will pass.
I stands for the INNINGS the farmer will get,
when he claims his full share for his backache and sweat.
J stands for the JOKES that make the time fly,
when markets are down and you feel like a cry.
K stands for the KNOWLEDGE we need to succeed,
so to figures and facts we should give proper heed.
L stands for LIME and good LEGUMES of course.
We need both of these our production to force.
M stands for the MAN--most important of all.
If he's of poor stuff the whole show'll soon stall.
N stands for the substance in ammonium sulphate,
which makes the grass grow at a deuce of a rate.
O stands for OUR OWINGS--a common disease
when drought, hail and locust our bonza crops seize.
P stands for the PHOSPHATES which improve all our grazing.
They're a sine qua non for all in stock raising.
Q stands for the QUESTIONS we should ask when we're able,
so that costs of production are less in our stable.
R stands for the RAIN--the cause of our plight;
it's too late, or too early, too much, but ne'er right.

S stands for the SILAGE from surplus grass made.
It keeps well for ages, so don't be afraid.
T stands for the TROUBLE we've all got to take,
if our farm for our children we fast wish to stake.
U stands for our UNION of races and hearts:
We've problems enough without any false starts.
V stands for our VELD--Dame Nature's best gift,
but if not cared for e'en firm soil will shift.
W stands for the WASTAGE that takes place each season
of veld that's unused and not managed with reason.
X stands for the XYLEM you'll always produce,
if methods more modern you won't put in use.
Y stands for the YEARNING we've all got at heart,
to do things just right and make a fresh start.
Z stands for the ZEALOUS who'll make the game go:
Good cows on good pastures will put up "some show."

And now relieved readers we've come to the end,
We'll no further time on such verbiage spend.
We wish you all luck in your various ways
And hope you'll be finding that good pasture pays.

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MONEY TALKS

In every year since 1924, with the exception of 1932, meat animals have been the average American farmer's biggest source of farm cash income. Dairy products were first in 1932, fourth in 1924 and 1925, and second in the other nine years. Fruits and vegetables have ranked third since 1930, poultry and eggs have usually ranked sixth. The average 12-year percentage of the average American farmer's cash income obtained from the sale of meat animals in 1924-35 was 23.5 percent, or nearly one-fourth of his total average cash income. This did not include rental, benefit and drouth relief payments to livestock farmers by the Government in 1933-35. Inclusion of these payments would have raised the percentages in 1933-34 only slightly. So large is the livestock industry of the United States that in 1934 farmers received more than one and a half billion dollars for the cattle and calves, sheep and lambs, and hogs which they sent to market, exclusive of Government or drouth relief payments. Of this amount, $701,600,000 were received for cattle and calves, $697,600,000 were received for hogs, and $104,400,000 were received for sheep and lambs.

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The final test of a gentleman --his respect for those who can be of no possible service to him. --Wm. Lyon Phelps.

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People who have half an hour to spare usually spend it with someone who hasn't. --Indianapolis Star.

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RECENT PUBLICATIONS

(Only Federal publications are available from Washington. Others listed may be obtained in most instances from the institution or agency issuing them. Do not write Washington for other than U.S.D.A. publications.)

Federal

"Weight and Cost of Livestock Slaughtered under Federal Inspection, 1936" - Mimeographed tables by species of animals, issued by Bureau of Agricultural Economics, U.S.D.A., Washington, D. C.

"Estimated Production and Consumption of Federally Inspected Meats, 1936" - Mimeographed tables for each variety of product issued by the Bureau of Agricultural Economics, U.S.D.A., Washington, D. C.

"Hogs in Belgian Agriculture" by H. E. Reed - U.S.D.A., Bureau of Agricultural Economics, Washington, D. C. Apr. 1937. 12 pages, mimeo.

"The Farmer's Share of the Consumer's Food Dollar" - U.S.D.A., Bureau of Agricultural Economics, Washington, D. C. - Leaflet No. 123, Feb. 1937. 6 pages.

"Comparison of Feeds for Wintering Steers in the Northern Great Plains" - U.S.D.A., Bureau of Animal Industry, Washington, D. C., Technical Bulletin No. 565. May 1937. 10 pages, illus.

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"Improving Horses and Mules" - U. S. Department of Agriculture, Washington, D. C. - Yearbook Separate No. 1564. 1937. 16 pages, illus.

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"Planning County Agricultural Extension Programs" by Fred B. Morris - U.S.D.A., Extension Service, Washington, D.C. - Circular 260. Apr. 1937. 33 pages, mimeo.

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State

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"Selection and Care of Beef Cattle in Georgia" by R. E. Davis - Georgia Extension Service Bulletin 460. Jan. 1937. 16 pages, illus.

"Feeding and Management Experiments with Brood Sows and Litters" by C. M. Vestal - Indiana Experiment Station Bulletin No. 413. May 1936. 44 pages, 40 tables.

"Livestock Marketing Methods in Denmark, Great Britain and Canada" by Geoffrey Shepherd - Iowa Experiment Station Bulletin 353. Jan. 1937. 45 pages, illus. & tables.

"Grazing and Parasitical Studies with Cattle and Sheep" by M. G. Snell - Louisiana Experiment Station Bulletin 279. Oct. 1936. 38 pages, illus. & tables.

"Controlling Horse Parasites" by B. J. Killham - Michigan Extension Service Bulletin 174. Jan. 1937. 4 pages, 2 figs.

"Studies on the Physiology of Reproduction in the Sheep, IV. Fetal Development" by Laurence M. Winters and George Feuffel - Minnesota Experiment Station Technical Bulletin 118. Aug. 1936. 20 pages, 12 figs.

"Minerals for Farm Animals" by L. S. Palmer - Minnesota Extension Service Special Bulletin 94. Rev. Aug. 1936. 11 pages, 5 figs.

"Livestock Shows and Sales" by C. J. Goodell and Paul F. Newell - Mississippi Extension Service Bulletin No. 81. Nov. 1936. 36 pages, illus.

"Pig Club Manual" by Paul F. Newell and C. J. Goodell - Mississippi Extension Service Bulletin No. 78. Nov. 1936. 86 pages, illus.

"Rations for Weanling Pigs" by L. A. Weaver - Missouri Experiment Station Bulletin 376. Jan. 1937. 8 pages, 4 tables.

"Production and Quality of Meat From Native and Grade Yearling Cattle" by Earl H. Hostetler et al - North Carolina Experiment Station Bulletin No. 307. Nov. 1936. 36 pages, illus.

"Pork: Home Killing, Cutting, Curing" by John W. Wuichet and L. E. Kunkle - Ohio Extension Service Bulletin 187. Dec. 1936. 23 pages, 19 figs.

"Creep Feeding Beef Calves" by Paul G. Adams and F. W. Beall - Oklahoma Extension Service Circular No. 345. 1937. 15 pages, illus.

"Meat Consumption in Rural Tennessee" by Allred and Powell - Report No. 18 of the Agricultural Economics Dept., Tennessee Agricultural Experiment Station. Aug. 1936. 26 pages, mimeo.

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"Stomach Worms of Sheep" by B. A. Beach and J. J. Lacey - Wisconsin Extension Service Special Circular. May 1936. 4 pages.

Other

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"Making Pastures Pay...In the South" - Pamphlet No. 106.
"Making Pastures Pay...In the Middle West" - Pamphlet No. 105 - published by The National Fertilizer Association, 616 Investment Bldg., Washington, D. C. - 15 pages each, illus.

"Summary of Lamb Grading and Marketing in Virginia, 1936" by J. H. Meek - Virginia Department of Markets, Richmond.

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